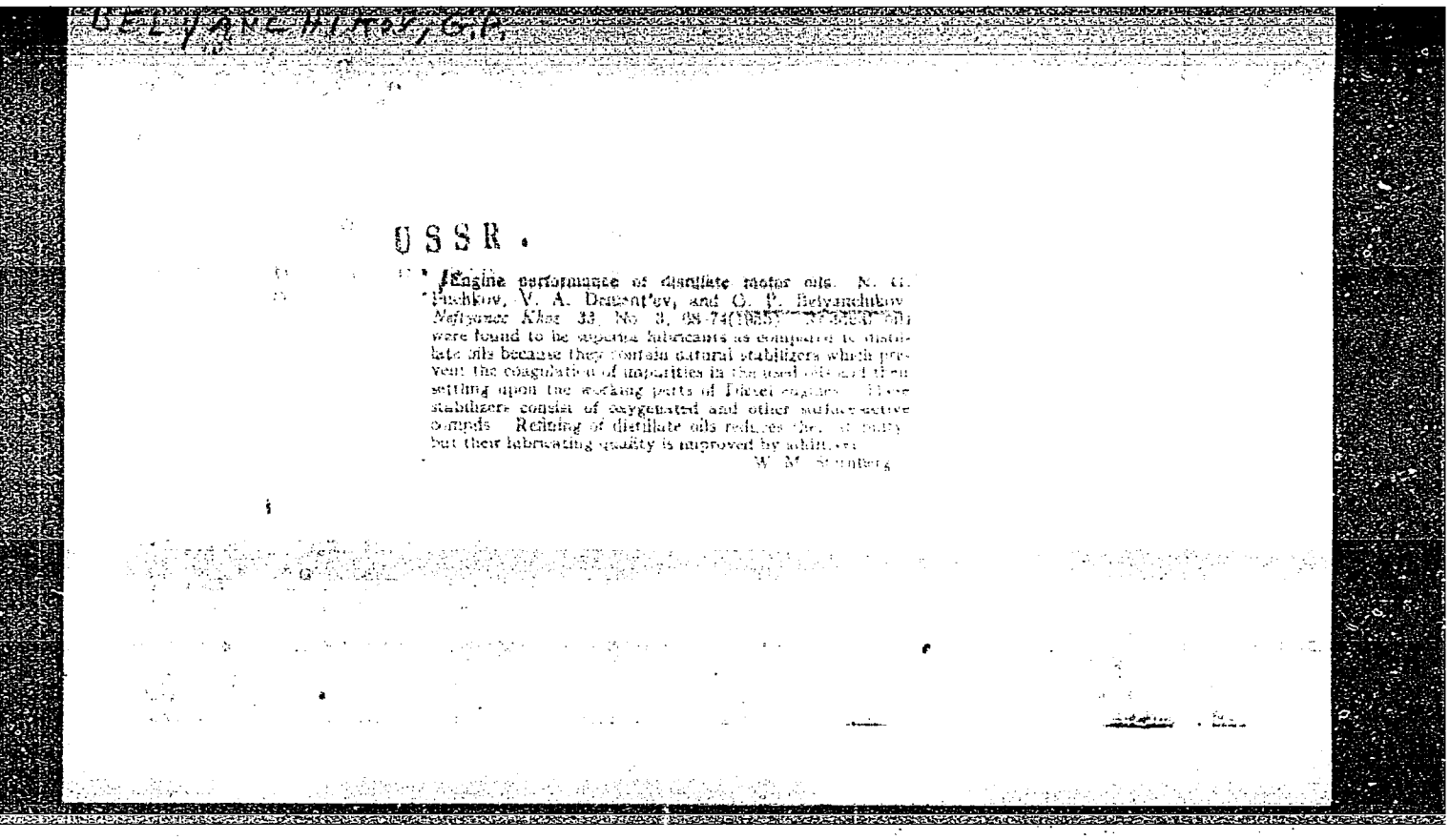

USSR

Engine performance of distillate motor oils. N. G. Pushkov, V. A. Dzerzhinskiy, and O. P. Belyanchikov. *Neftyanoe Khoz.* 33, No. 3, 68-74(1955). [illegible] were found to be superior lubricants as compared to distillate oils because they contain natural stabilizers which prevent the coagulation of impurities in the used oils and their settling upon the working parts of Diesel engines. These stabilizers consist of oxygenated and other surface-active compds. Refining of distillate oils reduces the [illegible] but their lubricating quality is improved by additives.

W. M. Sternberg

BELYANCHIKOV, G.P.

PHASE I BOOK EXPLOITATION 917

Vsesoyuznyy nauchno-issledovatel'skiy institut po pererabotke nefti i gaza i polucheniyu iskusstvennogo zhidkogo topliva

Issledovaniye i primeneniye nefteproduktov (Study and Use of Petroleum Products) Moscow, Gostoptekhizdat, 1957. 213 p. (Series: Its: Trudy vyp. 6) 1,000 copies printed.

Eds.: Puchkov, N.G., Zaslavskiy, Yu. S.; Executive Ed.: Kleymenova, K.F., Engineer; Tech. Ed.: Mukhina, E.L.

PURPOSE: This book is intended for engineering and scientific personnel concerned with the production, study and use of petroleum products.

COVERAGE: This collection of articles gives the results of the scientific research work of the Vsesoyuznyy nauchno-issledovatel'skiy institut po pererabotke nefti i gaza i polucheniyu iskusstvennogo Zhidkogo topliva (All-Union Scientific Research Institute for the Processing of Petroleum and Gas for the Production of Synthetic Liquid Fuel) on the operational properties

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of fuels and lubricating oils and describes methods for investigating, by the use of radioactive isotopes, the chemical composition and physicochemical properties of petroleum products and the wear-resistant properties of oils.

TABLE OF CONTENTS:

I. TESTING FUELS AND LUBRICATING OILS

Diesel oil from eastern Devonian petroleum deposits with high sulfur content (up to 1 percent or more) was evaluated on the basis of the following criteria: 1) motor properties, 2) power and economy factors (in motor D-35), 3) wear of motor parts (the main criterion), and 4) functional stability. Laboratory investigations and extended tests of this oil, with additives "aznii-4" and "tsiatim-339", showed that it guarantees normal length of service for tractor and automobile diesels (D-35 andYaAZ-204 respectively), and is equal in quality to

oil from Baku deposits. There are 8 tables and 1 Soviet reference.

Puchkov, N.G., and Belyanchikov, G.P. Fuel for High-speed Diesels 13

The present article gives comparative test data on standard fuel (according to GOST 4749-49 DL), fuel from the heavier fractions of petroelum, and compound fuel (a mixture of gas oil fuel and fuel from heavier fractions in a ratio of 30:70), on the basis of their performance in a two-cycle YaAZ-204 engine. It is concluded that fuel from the heavier fraction of petroleum may be utilized with a slight increase in viscosity (12 cst or $\eta_{20} \cong 2$) and the absence of heavy tarry residues (95 percent vaporizes at 400°). Fuels from catalytic cracking with a cetane number of 40, in the pure state and mixed with fuels of direct distillation may be widely used in modern tractor engines. There are 4 tables, 6 figures and 6 Soviet references.

Card 3/17

This article gives the comparative results of the role of the viscosity of oils at low temperatures in starting motors ZIL-120 and GAZ-51. The installation of a more powerful starter may increase the limit viscosity which fixes the flowability and starting temperature limits of the oil within the intervals 100 to 300 poises and 20-25 to 100 poises, respectively. Experimental data indicate that for these two large motors the minimum viscosity values for oil are 250 and 100 poises for flowability and starting respectively. There are 8 figures, 2 tables and 4 Soviet references.

The author states that present methods of tesing lubricating oils are neither satisfactorily accurate nor comprehensive in providing data which will aid in choosing the proper oil for a given motor. Proposals for improving these conditions are given. There are 7 tables and 6 references, of which 5 are Soviet and 1 English.

Serov, A.V. The Basis for Methods of Short-term Tests for Evaluating the Wear-resistant Properties of Diesel Oils 46

In this article the author cites methods of evaluating wear-resistant properties of diesel oils on the basis of several considerations which are discussed at length. It is stated that determination of motor wear according to the amount of iron dissolved in the lubricating oil is quite possible. It is concluded that the basic factors determining the rate of motor wear are the rotational speed of the crankshaft, motor load, and temperature, although the influence of the latter is apparently less noticeable in diesels than in carburetor motors. There are 7 figures, 4 tables and 7 Soviet references.

II. INVESTIGATION OF PETROLEUM PRODUCTS

Zaslavskiy, Yu. S.; Shor, G.I.; Kirillov, I.G.; Lebedeva, F.B.; Yevstigneyev, Ye. V.; and Zlobin, O.A. The Application of

This investigation concerned the capacity of additives to demonstrate an inhibiting action on oil during the operative process (i.e., to ensure an antioxidizing effect), or the capacity to prevent the catalytic influence of surface metal on the oxidation of oil. It was found that the protective coating, once having formed, later begins to decompose and erode, and is eventually washed off the metal surface completely; retardation of corrosion, therefore, is most effective during the formation of the protective coating. Engineers A.I. Kuznetsova, I.A. Morozova; Technicians M.B. Koziyenko, N.M. Avdeyeva,; and laboratory assistants P.I. Shishova and N.V. Dmitriyeva participated in the work. There are 16 figures, 1 table, and 14 references, of which 12 are Soviet and 2 English.

Zaslavskiy, Yu. S.; Shneyerova, R.N.; Shor, G.I.; and Kuznetsova, A.I. Radiochemical Investigation of the Stability of Solutions of Additives in Oils 107

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This investigation was made because of the need for additives that will not precipitate from oil under the influence of various factors. It was found that, by using tagged atoms in a method based on centrifuging, stability could be determined by measuring the radioactivity of the oil layers after centrifuging. Professor S.E. Kreyn acted as consultant in the work. There are 3 figures, 4 tables and 3 Soviet references.

Tilicheyev, M.D. Cryoscopic Methods of Analyzing the Hydrocarbon Content of Petroleum Products. I. Cryoscopic Methods of Analysis Without a Solvent 117

The author bases the method mentioned in the title on a principle of chemical thermodynamics which states that the temperature of crystallization of any solvent is lowered 1° by the same amount of any substance on condition that it is soluble in the liquid phase and insoluble in the solid phase of the solvent and forms and ideal solution with it.

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On the basis of this law, and by accurate determination of crystallization temperature, the author determines, and gives methods and equations for determining, a) the purity of individual admixtures (hydrocarbons), b) the quantity of individual admixtures, and c) the concentration of sulfuric acid. S.A. Yuganova participated in b), and V.P. Peshkov, Doctor of Physical and Mathematical Sciences, acted as consultant.

Tilicheyev, M.D.; Okishevich, N.A.; Borovaya, M.S.; and Goysa, Ye. I. Cryoscopic Methods of Analyzing the Hydrocarbon Content of Petroleum Products II. Cryoscopic Methods of Analysis Using Solvents 130

This article reviews the above-mentioned method in which the authors determine the amount of admixture by taking a solvent with a sufficiently high value and adding 1 percent mol of a substance. By observing the change in crystallization temperature of cyclohexane, it was possible to determine

the amount of admixture with a degree of error of plus or minus 1 percent. This method and the chromatographic method were used to determine the amount of aromatic hydrocarbons in gasoline (with a degree of error of plus or minus .6 percent), the amount of nonsulfonated admixtures in different fractions of aromatic hydrocarbons, and the quantitative determination of aromatic hydrocarbons in petroleum oils in a solution of cyclohexane. V.S. Buk participated in the quantitative analysis of aromatic hydrocarbons in petroleum oil. There are 3 figures, 21 tables and 12 references, of which 9 are Soviet and 3 English.

Tilicheyev, M.D.; Goysa, Ye.I.; Tsyganova, Ye V. A Gravimetric Method for the Quantitative Determination of Aromatic Hydrocarbons in Light-colored Petroleum Products 148

This paper gives the results of tests of aviation gasolines, "Galosha" gasoline, and white spirit (a turpentine subsitute) for the presence of aromatic hydro-carbons. Two variants of

the method were used, which include (Variant I) treatment with sulfuric acid and rinsing with water and (Variant II) titration with a 0.1 n solution of KOH. The accuracy of this method was determined with synthetic mixtures of alkanes and cyclanes(naphthenes) of gasoline B-70 and 2.2,4 - trimethyl pentane.(iso-octane). Variant I, with a degree of error of plus or minus .5 percent, is recommended, whereas Variant II had a degree of error of plus or minus .8 percent. There are 7 tables and 1 Soviet reference.

Tilicheyev, M.D. Basing the Boiling Point of Petroleum Products on Atmospheric Pressure 156

Boiling points are "brought to normal" according to the pressure of saturated vapors of individual hydrocarbons, on the basis of n-alkanes. The author states that this method and others lead to serious errors, and gives methods for

computing these boiling points when transferring from one pressure to another by using the coefficients of Antoine's equation ($t_p = \frac{B}{A - \lg P} - C$) and a graphic method based on the molecular weights of the compounds. There are 3 figures, 4 tables and 11 references, of which 6 are Soviet and 5 English.

Ptashinskiy, I.A. and Guseva, R.I. Electrometric Method of Evaluating the Corrosive Aggressiveness of Lubricating Oils 174

This article gives a resume of research on the electrochemical nature of the corrosions of metals in different solutions. The electrochemical nature of the corrosion process was proven for solutions of acids and for oil SU, and a satisfactory method for measuring the electric potential of a metallic electrode in lubricating oil was worked out. There are 3 tables and 7 Soviet references.

Ptashinskiy, I.A. and Frolova, M.K. Polarographic Method of Determining Tetraethyl Lead in Gasolines 181

The authors offer a simpler and more reliable method of determining the concentration of tetraethyl lead in aviation and automobile gasolines. The quantity is computed according to the formula TL ($Pb(C_2H_5)_4$) = $\frac{323.22\ C \cdot 75}{10\rho}$, where TL is the quantity of tetraethyl lead per g/kg. of gasoline; C the concentration of lead chloride, determined according to a calibrated graph based on the polarographing of the tested solution; and the density of gasoline at 20° C. The quantity of ethyl liquid product P-9 per ml. in 1 kg. of gasoline is: X= 1.213 TL. It is stated that this method requires 1/3 to 1/4th as much time as standard methods. There is 1 figure, 1 table and 3 references, of which 2 are Soviet.

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flows through the shutoff valve of the gas container increases the effectiveness of corrosion protection. The acidity of this liquid does not have a negative effect on its protective properties. There are 7 tables and 1 figure.

Kaulina, M.M. and Luneva, V.C. Evaluation of the Viscosity Properties of Consistent Lubricants at Low Temperatures by Using Rotary and Capillary Viscometers 199

The above-mentioned methods are described in detail. 1) The rotary viscometer [Ref. 2] is based on measuring the resistance of lubricants on a revolving roller. 2) The capillary viscometer [Ref. 1, 4, 7] is based on measuring the resistance of oils passing through a capillary tube. The rotary viscometer has no temperature limitations, it is stated, and the viscosity of lubricant greases can be determined at -30° C. The rotary method was worked out by

V.P. Pavlov and the capillary method by the Institut nefti AN SSR (Petroleum Institute, Academy of Sciences, USSR). There are 2 tables, 2 figures and 7 Soviet references.

Bagryantseva, P.P. and Badayeva, M.K. The Influence of the Volatility and Viscosity of Mineral Oils on the Operational Properties of Cold-resistant Consistent Lubricants 206

Commercial lubricants were investigated to compare their physicochemical and volume properties, and to test their work capacity in roller bearings on stands and under operational conditions as well. It was concluded that viscosity properties and work capacity of lubricants are dependent upon the hydrocarbon content and upon the volatility and viscosity, respectively, of their component mineral oils. Also, volatility showed great influence on viscosity properties, which were dependent in a linear relationship. Experiments were carried out at an experimental station of the ENII PP. There are 9 figures and 4 tables.

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Luneva, V.S., and Kovalev, V.A. Quick Method for Determining the Protective Capacity of Concistent Lubricants 219

This article outlines methods for and gives results of evaluating the protective effectiveness of lubricants against corrosion in both liquid and gaseous media. Petrolatum, gun lubricant and commercial vaseline were the more resistant to gaseous corrosion, while corrosion was best controlled in liquid media according to GOST 5757-51, which is based on measuring the width of the protective coating of oil deposited on metal surfaces at various temperatures, and several other factors. There are 4 figures, 7 tables and 14 Soviet references.

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Card 17/17

AUTHORS: Puchkov, N.G., Borovaya, M.S., Belyanchikov, G.P. and Gavryukhin, N.M. (V.N.I.I. NP)

TITLE: Wearability of an additive in oil during its work in an engine. (Srabatyvayemost' prisadki pri rabote masla v dvigatele).

PERIODICAL: "Khimiya i Tekhnologiya Topliva i Masel" (Chemistry and Technology of Fuels and Lubricants), 1957, No.2, pp.49-56 (U.S.S.R.)

ABSTRACT: The problem of the required level of concentration of additives in oils at which the wear of an engine operating with high sulphur fuel will not exceed the wear obtained with a low sulphur fuel and the limits of the possibilities of additives in suppressing corrosion wear were investigated. As a first step a method of determining the rate of consumption of an additive in oil was required. This was developed on the basis of determining the content of barium chemically bound in an additive and that split off from the additive and combined with products formed on combustion of fuel and oxidation of the oil (barium in octane and benzene soluble and in the residue insoluble in these two solvents). The efficiency of an additive at various levels of sulphur in the fuel was studied using an alkylphenol compound TsIATIM-339. It was shown that the additive is being consumed during operation of an engine (YAZ-204) and that the metallic component of the

Wearability of an additive in oil during its work in an engine. (Cont.)

additive is transformed into insoluble compounds which are partially filtered off with the products of the oxidation of the oil. The rate of consumption increases with increasing sulphur content of fuel. 5-10% additions of the above additive decrease the engine wear but the degree of wear obtained with low sulphur fuel cannot be attained. An increase in the concentration of the additive decreases corrosion wear but simultaneously increases the wear by abrasion. Maximum useful concentration of the additive for operation with fuels containing below 1% sulphur should not exceed 3% and for fuels containing up to 1.3% of sulphur - 5%. The wear of engine was measured by the method developed by IMASH A.N. SSSR and weighing of compression rings. Experimental results are given in graph and tables. 7 tables and 5 figures, no references.

Card 2/2

PUCHKOV, N.G.; SEROV, A.V.; BELYANCHIKOV, G.P.; REZNIKOV, V.D.; PYSHKOV, S.I.

Suitavility for engines of diesel oils derived from sulfur crude oil.
Trudy VNII NP No.6:3-12 '57. (MIRA 10:10)
(Diesel fuels)

PUCHKOV, N.G.; BELYANCHIKOV, G.P.

Fuels for high-speed diesel engines. Trudy VNII NP no.6:13-23 '57.
(MIRA 10:10)
(Diesel fuels)

EMINOV, Ye.A.; OSHER, R.N.; PATSUKOV, I.P.; CHEKAVTSEV, N.A.; MAZYRIN, I.V.; FUKS, G.I.; VLADZIYEVSKIY, A.P.; PATSUKOV, I.P.; AVDEYEV, A.V.; LOPOYAN, G.S.; PETROV, G.G.; KOZOREZOVA, A.A.; LISITSKIY, K.Z.; YAKOBI, M.A.; BELYANCHIKOV, G.P.; IVANOV, V.S.; VORONOV, N.M.; RUMYANTSEV, V.A.; ZILLER, G.A.; BEREZHNAYA, V.D.; LEVINA, Ye.S., vedushchiy red.; TROFIMOV, A.V., tekhn.red.

[Manual on the uses and consumption standards of lubricants] Spravochnik po primeneniiu i normam raskhoda smazochnykh materialov. Moskva, Gos.nauchno-tekhn.izd-vo neft. i gorno-toplivnoi lit-ry, 1960. 703 p. (MIRA 13:4)
(Lubrication and lubricants)

L 20341-63 EPF(c)/EWT(m)/BDS AFFTC/APGC Pr-4 GW/WW/DJ

ACCESSION NR: AT3002006 S/2664/61/000/000/0311/0318

AUTHORS: Puchkov, N. G.; Borovaya, M. S.; Deryabin, A. A.; Belyanchikov, G. P.

TITLE: The testing of oils with additives on engines and mechanisms, and practical experience therewith. The testing of oils from sulfurous crudes with various additives.

SOURCE: Prisadki k maslam i toplivam; trudy nauchno-tekhnicheskogo soveshchaniya. Moscow, Gostoptekhizdat, 1961, 311-318.

TOPIC TAGS: lubricant, lubrication, additive, oil, engine, mechanism, sulfurous, S-containing, S, crude, premium, Series 0, Series I, Series II, Series III, AS-9.5, DS-8, DS-11, VNII NP-360, TsIATIM-339, VNII NP-362, PMS$_{Ya}$, Anglomol, Monsanto, Santalube, DK-2, Esso, Castrol, Shell, Rimula, Mobilguard, YaAZ-204, GAZ-51, D-35, 2D100, oxidation, antioxidation, ash content, PZV, Kolomenskoye.

ABSTRACT: The paper sets forth the generalization of results of tests of a number of domestic additives in comparison with some foreign additives, in an attempt to obtain oils of Series I, II, and III by means of such additives. Tests comprised Esso 20W/30 and AS-9.5 with various additives in the premium grade (Series 0); Castrol-30, Shell X-100, and DS-11 with various additives in Series I; Rimula-30,

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ACCESSION NR: AT3002006

SAE 30 (Shell), and DS-11 with additives in Series II; and Mobilguard-593 and DS-11 with Santalube-311 additive in Series III. Ash content, PZV merit factor, oxidation in the DK-2 testing device (residue in %, change in viscosity in cst at 100°C, and high-temperature stability in min) are tabulated. Detailed data for engine tests in the GAZ-51, D-35, and YaAZ-204 engines, as well as 600-hr long-term tests in the GAZ-51 are tabulated. Details on the operational qualities of DS-8 and DS-11 with various additives are adduced. These laboratory investigations and engine tests of oils with additives show that existing domestic additives permit the obtainment of engine oils of a new grading system corresponding to foreign oils of premium and Series I type for stringent engine-operating conditions. These oils are also suitable for use in older engines. Additives for oils of Series II and III, required for newly projected engines, must still be developed. Some domestic additives, suitable for making of oils of Series 0 and I, approach the quality of foreign additives. However, additional work is required to establish optimal selection and concentration criteria for these additives. Additional work is required to improve additives for oils of Series I for engines such as the Kolomenskoye-Plant Diesel engines, the SPGG, and others. Additional work to reduce the content or change the character of metal-organic compounds in additives is required to reduce the precipitates in the combustion chamber which increase the wear; the antioxidation properties of additives must also be improved.

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ACCESSION NR: AT3002006

Orig. art. has 7 tables.

ASSOCIATION: VNII NP

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29237
Z/011/61/018/010/004/011
E194/E384

15.6200
11.9100

AUTHORS: Reznikov, V.D. and Belyanchikov, G.P.

TITLE: Filtration capacity as an indicator of the properties of motor oils

PERIODICAL: Chemie a chemická technologie; Přehled technické a hospodářské literatury, v. 18, no. 10, 1961, 467, abstract Ch61-6463 (Khimiya i tekhnologiya topliv i masel, no. 10, 1960, 41 - 44)

TEXT: One of the characteristics used to assess the performance of lubricating oils in engine tests is the weight of deposit retained on the oil filter. In the case of straight mineral oil, high filter deposits indicate poor thermal stability of the oil. Additive-type oils usually give smaller amounts of deposits on filters and the scatter of results is very great; therefore the amount of deposit formed on the filters is not a reliable index of the quality of additive-type oils. However, if the criteria are correctly chosen the amount and nature of deposits formed upon the filter can serve to characterize the oil. For given test conditions, the deposit properties are

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Filtration capacity ....

fairly stable. Thus, in testing an engine type Д-35 (D-35), deposits contain 66 - 80% oil and resin, the remainder being benzene insolubles. The main factor governing the amount of deposits retained on the filters is the dispersion of the deposits. Accordingly, oils with detergent or dispersive additives are best characterized not by the absolute amount of filter deposit but by the proportion of the total contamination in the oil that is retained on the filter. Kadmer and Mauser (Ref. 2) have defined the degree of filterability in this way and Soviet work has shown that this factor is related to the anti-deposit-forming tendencies of the oil in an engine under laboratory conditions. It is considered that high-ash, heavy-duty oils should give filterability factors not greater than 30%; oils of high quality can give up to 50% but samples giving values greater than 70% give unsatisfactory engine performance. This applies to filters type АСЦО (ASFO) and other values will doubtless be valid for different filters. The results apply to an engine type D-35, using fuel with 1% sulphur content. The degree of filterability is of less significance as a characteristic of anti-deposit-forming tendencies. The complete absence of

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deposits on a type ASFO filter indicates a very high degree of dispersion and stability but there may be a risk of wear if there is no deposit. If the filter does not retain anything, the effect is the same as if the engine had no filter and particles capable of causing wear can accumulate in the oil. Accordingly, the degree of filterability that corresponds to the best conditions, both from the standpoint of deposit-formation and wear, is 20 - 35%. Minimum engine wear resulting from iron in the oil and on the filter was observed when the filter retained 40 - 60% of the contaminants that enter or form in the oil. 5 figures, 4 references.
[Abstracter's note: the brief Czech abstract abstract has been substituted by an abstract of the original article.]

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REZNIKOV, V.D.; BELYANCHIKOV, G.P.

Filterability as an index in the engine testing of lubricating oils. Khim.i tekh.topl.i masel 5 no.10:41-44 O '60. (MIRA 13:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po pererabotke nefti i gazov i polucheniyu iskusstvennogo zhidkogo topliva.
(Lubrication and lubricants) (Filters and filtration)

S/081/62/000/006/095/117
B162/B101

11.9700

AUTHORS: Puchkov, N. G., Borovaya, M. S., Deryabin, A. A., Belyanchikov, G. P.

TITLE: Tests on oils from sulfur petroleums with various additives

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 6, 1962, 546, abstract 6M293 (Sb. "Prisadki k maslam i toplivam". M., Gostoptekhizdat, 1961, 311-318)

TEXT: Laboratory evaluation and results of motor tests of a series of imported oils (with additives) of the "premium" grade, I, II, and III and Soviet oils АС-6 (AS-6), АС-9.5 (AS-9.5), АС-11 (DS-11), and АС-8 (DS-8) from sulfur petroleum with the additives Вниии НП-360 (Vnii NP-360), ИП-22 (IP-22), ПМСя (PMSya), СБ-3 (SB-3), НГ-102 (NG-102), Vnii NP-362, PMSya + Vnii NP-353, Vnii NP-370, Vnii NP-371, Циатим-339 (Tsiatim-339), and some others. The motor tests were carried out in test-bed and operating conditions on the engines ГАЗ-51 (GAZ-51), Д-35 (D-35), ЯАЗ-204 (YaAZ-204), 2Д-100 (2D-100), СМД (SMD), and КДМ-46 (KDM-46). The tests showed that Soviet oils with the additive Vnii NP-360 (0%) or the additive IP-22

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S/081/62/000/006/095/117
B162/B101

Tests on oils from sulfur ...

satisfy the requirements for oils of grade I. Soviet oils with the additives Tsiatim-339, Vnii NP-370, or Vnii NP-371 in a concentration of 3-3.5% proved to be equivalent to the imported oil ESSO-20 W/30 of "premium" grade. [Abstracter's note: Complete translation.]

Card 2/2

S/[illegible]

AUTHORS: Puchkov, N.G., Candidate of Technical Sciences; Dobyanskiy, A.F., Malyavinskiy, L.V., Belyanchikov, G.P., Engineers

TITLE: Engine tests of various lubricant and fuel additives.

SOURCE: Bor'ba s korrozliyey dvigateley vnutrennego sgoraniya i gazoperekachivayushchikh ustanovok. Vses. sovet nauchno-tekhn. obshchestv. Moskva, Mashgiz, 1960, 32-40.

TEXT: Additives were tested to ascertain their effectiveness against the [illegible] compounds contained in the fuel and its combustion products. Simultaneous use of additives (A) in the fuel (F) (which diminish corrosion-wear of [illegible] linings and pistons, reduce scale formation, and help keep the piston rings [illegible] and in the lubricant (L) (which reduce corrosion-wear and help maintain the L [illegible] is found most advantageous. The existing multipurpose LA [illegible] (GrATIM), [illegible] serves well in a number of relatively low-powered Diesel (D) engines (E) in tractors, automobiles, ships, locomotives, and general-purpose power-plants (types listed individually) with fuels containing up to 1% S, but fails [illegible] of more [illegible] high-performance engines (types listed). A [illegible] and [illegible] A's were tested in the 4-stroke M-16 (D-3) [illegible]

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[illegible] tests of [illegible] lubricant and fuel additives. S/180-[illegible]

[illegible] (YaAZ-204) E. Measurements were made [illegible] the cylinder liners and piston rings, the number of piston rings [illegible] deposit[illegible] amount of deposit on pistons and rings, and the amount of [illegible] A table reports short-term test results on [illegible] A's [illegible] the best detergent, wear-reducing, and [illegible] E, but are not effective in keeping [illegible] in fact, increase the piston-face deposits in the [illegible] engine, a 6% ВНИИ НП-360 (VNII NP-360) A was [illegible] respect. In tests with the [illegible] E with fuel containing [illegible] found most effective (all data tabulated). [illegible] 2Д-100 (2D-100) and YaAZ-204, the VNII NP-[illegible] was found most effective (test data tabulated). [illegible] most effective in F (in tests with the [illegible] in piston and ring deposits; the ВНИИ НП-[illegible] to be the over-all most effective [illegible] of the fuel-injector nozzles by [illegible] figures and [illegible] tables, no references.

ASSOCIATION: [illegible]

[illegible]

32531
S/065/62/000/001/002/002
E194/E135

11.9100 also 1583

AUTHORS: Puchkov, N.G., Borovaya, M.S., Belyanchikov, G.P., Zelenskaya, R.G., and Severov, Ye.G.

TITLE: Service performance of basic lubricants refined in different ways

PERIODICAL: Khimiya i tekhnologiya topliv i masel, no.1, 1962, 53-59

TEXT: Engine tests at the VNII NP showed that engine oils derived from Eastern high sulphur crudes caused ring-sticking. In this respect alone they were worse than Baku oils, being equal or better in all other respects. Accordingly, a study was made of hydrocarbon group and ring structure and other properties of various lubricants before and after engine testing. Eastern and Baku oils were found to be generally very similar but differ in the content of sulphur compound and in hydrocarbon structure. Because of their constitution Eastern oils oxidise to form oxyacids and asphaltenes which promote ring sticking. Even though the oil-resin contents of the initial base oils were

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Service performance of basic ...

similar, the oils from Eastern crudes produced more lacquer in the engine and in a laboratory oxidation test than did Baku oils. Oils deeply refined by solvent, acid or adsorbents were more stable, but whereas the Baku oils so refined deteriorated at a steady rate the Eastern oils displayed an induction period, being initially the more stable, but later oxidising more rapidly. Adsorption refining was particularly effective in improving the stability of the oils and reducing ring sticking with oils of Eastern crudes, giving satisfactory performance even without the use of additives. Work is in progress on hydrofined Eastern oils and preliminary indications are that this treatment gives somewhat higher VI than solvent treatment. However, hydrofined Eastern oils have inferior additive susceptibility, particularly to sulphonates, though their properties were much improved by additive ВНИИ НП-360 (VNII NP-360). Hydrofined oils with this additive behaved well in 100 and 600 hour gasoline engine tests and in 800 hour diesel engine tests. A simple comparison of certain physical properties of hydrofined Eastern oil with those of Essolube, and Shell Rimula oils, indicates that the Soviet

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32531
Service performance of basic ... S/065/62/000/001/002/002
E194/E135

base oils can be as good as foreign ones. The need to match additive to base oil is emphasised.
There are 5 figures, 9 tables and 4 Soviet-bloc references.

ASSOCIATION: VNII NP

Card 3/3

PUCHKOV, N.G.; TRAKTOVENKO, I.A.; BELYANCHIKOV, G.P.; GAVRYUKHIN, V.M.; SAN'KO, Z.A.

Performance characteristics of winter diesel oil from eastern sulfur-bearing crudes. Khim.i tekh.topl.i masel 8 no.1:58-63 Ja '63. (MIRA 16:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po pererabotke nefti i gazov i polucheniyu iskusstvennogo zhidkogo topliva.
(Diesel fuels)

L 20632-66 EWT(m)/T DJ

ACC NR: AP6011220 (A) SOURCE CODE: UR/0413/66/000/006/0057/0057

INVENTOR: Blagovidov, I. F.; Druzhinina, A. V.; Monastyrskiy, V. N.; Puchkov, N. G.; Deryabin, A. A.; Borovaya, M. S.; Filippov, V. F.; Avaliani, T. K.; Zaslavskiy, Yu. S.; Tarmanyan, G. S.; Shor, G. I.; Dmitriyeva, N. A.; Belyanchikov, G. P.; Kuliyev, A. M.; Suleymanova, F. G.; Zaynalova, G. A.; Sadykhov, K. I.

ORG: none

TITLE: Preparative method for motor oils. Class 23, No. 179868

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 6, 1966, 57

TOPIC TAGS: lubricating oil, lubricant additive

ABSTRACT: An Author Certificate has been issued for a preparative method for motor oils, involving the introduction of additives. To impart the required service properties, the additives used are an alkylphenol-formaldehyde condensation product (3—15%), a sulfonate additive (1—6%), an additive based on xanthates or dithiophosphates (0.5—1%), and an organosilicon additive (0.003—0.005%) [the additives are no further identified in the source]. [SM]

SUB CODE: 11/ SUBM DATE: 02Aug62/ ATD PRESS: 4225

Card 1/1 UDC: 665.521.5002.237

BELYANCHIKOV K.P.

BARDIN, I.P., akademik; ANTIPOV, M.I., nauchnyy redaktor; BELYANCHIKOV, K.P., nauchnyy redaktor; ORLOV, I.V., inzhener, nauchnyy redaktor [illegible]; KUDASHEV, A.I., redaktor izdatel'stva; KLIMOV, V.A., redaktor izdatel'stva; KISELEVA, A.A., tekhnicheskiy redaktor

[Iron ore deposits in the U.S.S.R.] Zheleznorudnaia baza chernoi metallurgii SSSR. Moskva, 1957. 565 p. (MLRA 10:10)

1. Akademiya nauk SSSR. Institut metallurgii. Mezhvedomstvennaia postoyannaia komissiia po zhelezu. 2. Nachal'nik Glavproyekta Ministerstva chernoy metallurgii SSSR (for Antipov). 2. Direktor Gosudarstvennogo instituta po proyektirovaniyu metallurgicheskikh zavodov (for Belyanchikov) 3. Gosudarstvennyy institut po proyektirovaniyu metallurgicheskikh zavodov (for Orlov)
(Iron ores)

BARDIN, I.P., akademik, otv.red.; STRUMILIN, S.G., akademik, red.; SHEVYAKOV, L.D., akademik, red.; SHCHERBAKOV, D.I., akademik, red.; ANTIPOV, M.I., red.; BELYANCHIKOV, K.P., red.; BRODSKIY, V.B., red.; YEROFEYEV, B.N., red.; LIBERMAN, A.Ya., red.; MELESHKIN, S.M., red.; ORLOV, I.V., red.; SMIRNOV-VERIN, S.S., red.; RIKMAN, V.V., red.; SAMARIN, A.M., red.; SLEDZYUK, P.Ye., red.; SKOBNIKOV, M.L., red.; SOKOLOV, G.A., red.; FREY, V.I., red.; KHLEBNIKOV, V.B., red.; SHAPIRO, I.S., red.; SHIRYAYEV, P.A., red.; KUDASHEV, A.I., red.izd-va; KUZ'MIN, I.F., tekhn.red.

[Magnetite ores of the Kustanay Province and their exploitation] Magnetitovye rudy Kustanaiskoi oblasti i puti ikh ispol'zovaniia. Otvetstvennyi red. I.P. Bardin. Moskva, Izd-vo Akad. nauk SSSR, 1958. 489 p. (Zhelezorudnye mestorozhdeniia SSSR). (MIRA 12:2)

1. Russia (1923- U.S.S.R.) Ministerstvo geologii i okhrany nedr.
(Kustanay Province--Magnetite)

BOLDYREV, G.P.; VOGMAN, D.A.; NOVOKHATSKIY, I.P.; VERK, D.L.; DYUGAYEV, I.V.; KAVUN, V.M.; KURENKO, A.A.; UZHEKOV, M.R.; ARSEN'YEV, S.Ya.; YEGORKIN, A.N.; KORSAKOV, P.F.; KUZ'MIN, V.N.; STRELETS, B.A.; PATKOVSKIY, A.B.; BOLESLAVSKAYA, B.M.; INDENBOM, D.B.; FINKEL'SHTEYN, A.S.; SHAPIRO, I.S.; LAPIN, L.Yu.. Prinimali uchastiye: NEVSKAYA, G.I.; FEDOSEYEV, V.A.; KASPILOVSKIY, Ya.B., ZERNOVA, K.V.. BARDIN, I.P., akademik, otv.red.; SATPAYEV, K.I., akademik, nauchnyy red.; STRUMILIN, akademik, nauchnyy red.; ANTIPOV, M.I., nauchnyy red.; BELYANCHIKOV, K.P., nauchnyy red.; YEROFEYEV, B.N., nauchnyy red.; KALGANOV, M.I., nauchnyy red.; SAMARIN, A.M., nauchnyy red.; SLEDZYUK, P.Ye., nauchnyy red.; KHLEBNIKOV, V.B., nauchnyy red.; STREYS, N.A., nauchnyy red.; BANKVITSER, A.L., red.izd-va; POLYAKOVA, T.V., tekhn.red.

[Iron ore deposits in central Kazakhstan and ways for their utilization] Zhelezorudnye mestorozhdeniia TSentral'nogo Kazakhstana i puti ikh ispol'zovaniia. Otvetstvennyi red. I.P.Bardin. Moskva, 1960. 556 p. (MIRA 13:4)

1. Akademiya nauk SSSR. Mezhduvedomstvennaya postoyannaya komissiya po zhelezu. 2. Gosudarstvennyy institut po proyektirovaniyu gornykh predpriyatiy zhelezorudnoy i margantsevoy promyshlennosti i promyshlennosti nemetallicheskikh iskopayemykh (Giproruda) (for Boldyrev, Vogman, Arsen'yev, Yegorkin, Korsakov, Kuz'min, Strelets,

(Continued on next card)

BOLDYREV, G.P.--(continued). Card 2.
3. Institut geologicheskikh nauk AN Kazakhskoy SSR (for Novokhatskiy). 4. TSentral'no-Kazakhstanskoye geologicheskoye upravleniye Ministerstva geologii i okhrany nedr SSSR (for Verk, Dyugayev, Kavun, Kurenko, Uzbekov). 5. Nauchno-issledovatel'skiy institut mekhanicheskoy obrabotki poleznykh iskopayemykh (Mikhanobr) (for Patkovskiy). 6. Gosudarstvennyy institut proyektirovaniya metallurg.zavodov (Gipromez) (for Boleslavskaya, Indenbom, Finkel'shteyn, Nevskaya, Fedoseyev, Karpilovskiy). 7. Mezhduvedomstvennaya postoyannaya komissiya po zhelezu AN SSSR (for Shapiro, Zernova, Kalganov). 8. Gosplan SSSR (for Lapin).
(Kazakhstan--Iron ores)

BARDIN, I.P , akademik, otv. red.[deceased]; BELYANCHIKOV, K.P., nauchnyy red.; YEROFEYEV, B.N., nauchnyy red.; ZVYAGIN, P.Z., nauchnyy red.; KOSHELEV, V V., nauchnyy red.; MELESHKIN, S.M., nauchnyy red.; MIRLIN, G.O., nauchnyy red.; MOSKAL'KOV, Ye.F., nauchnyy red.; POKROVSKIY, M.A., nauchnyy red.; SLEDZYUK, P.Ye., nauchnyy red.; FINKELSHTEYN, A.S., nauchnyy red.; KHARCHENKO, A.K., nauchnyy red.; SHEVYAKOV, L.D., akademik, nauchnyy red.; SHAPIRO, I.S., nauchnyy red.; SHIRYAYEV, P.A., nauchnyy red.; OKHRIMYUK, Ye.M., nauchnyy red.; YANSHIN, A.L., akademik, nauchnyy red.; MAKOVSKIY, G.M., red.izd-va; VOLKOVA, V.G.,tekhn. red.

[Oolitic iron ores of the Lisakovka deposit in Kustanay Province and means for their exploitation]Oolitovye zheleznye rudy Lisakovskogo mestorozhdeniia Kustanaiskoi oblasti i puti ikh ispol'zovaniia. Moskva, Izd-vo Akad. nauk SSSR, 1962. 234 p. (Zhelezorudnye mestorozhdeniia SSSR [no.1]) (MIRA 15:12)

1. Akademiya nauk SSSR. Institut gornogo dela.
(Kustanay Province—Iron ores)

AUTHORS: Belyanchikov, L. N., Grigorash, R. N., Panov, A. V. SOV/163-58-3-17/49

TITLE: The Electric Operation Schedule of Arc-Vacuum Melting (Elektricheskiy rezhim dugovoy vakuumnoy plavki)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958, Nr 3, pp 95 - 103 (USSR)

ABSTRACT: The electric operation schedules in arc-vacuum melting were investigated to determine the economy of melting furnaces. For this purpose the electric system of an arc-vacuum melt was used in a laboratory furnace with a content of 2-7 kg in crucibles of a diameter of 65 and 85 mm. The change of the arc voltage in the arc-vacuum melts was investigated. The arc voltage is a function of the amperage. The ratio of the diameter of the electrode to the diameter of the crucible is $\frac{d}{D}$. The dependence of the arc voltage on the amperage was investigated at D = 65 mm. Within the ranges investigated the amperage I = 1500 A. The dependence of the arc voltage on the amperage has a linear character. The dependence of the arc voltage on the ratio

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$\frac{d}{D}$ at D = 65 mm and at the amperage I = 1500 A was investigated. From the diagram may be seen that with the increase of the ratio $\frac{d}{D}$ the voltage drops. If the diameter of the electrode is greater than half the diameter of the crucible the decrease of the anodic voltage does not modify. An empiric formula for the determination of the voltage as dependent on the amperage and the diameter of the electrode is suggested:

$$U_{arc} = U_o + I \left(\frac{23,3.10^{-3}}{d^2} + 3,33.10^{-3} \right) \quad (3)$$

where U_o denotes the sum of cathodic and anodic voltages in Volt, I the amperage in the arc, and d the diameter of the electrode in centimeters. Furthermore the melting rate was investigated. The experiments showed that the rate of melting depends on the amperage. At higher amperages (higher than 2500 A) the melting rate increases with the increase of the diameter of the electrode. The dependence of the melting rate on the amperage was in-

vestigated at a diameter of D = 65 mm. The increase of the diameter of the electrode increases the heat emission coefficient of the electrode. On an increase of the amperage and with a greater diameter of the electrode the curve of the melting rate shows bends. There are 4 figures, 1 table, and 9 references, 4 of which are Soviet.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

SUBMITTED: April 24, 1958

AUTHORS: Belyanchikov, L. N., Grigorash, R. N., Panov, A. V. SOV/163-58-3-24/49

TITLE: Laboratory Vacuum Arc Furnaces (Laboratornyye vakuumnyye dugovyye pechi)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958, Nr 3, pp 142 - 148 (USSR)

ABSTRACT: The best conditions for metallurgical melting processes are given when the melting is carried out without ceramic crucibles and with a simultaneous degassing of the metal. The furnaces which have been used hitherto do not comply with these demands. A new type of furnace was devised which is called vacuum arc furnace. Such furnaces are constructed in a useful way taking into account the corresponding melting processes. Three types are suggested: 1) A furnace with hot consumable electrodes in neutral atmosphere at a pressure of 30-760 torr. 2) A universal type of vacuum arc furnace with consumable electrodes in neutral atmosphere. 3) A furnace with consumable electrodes in vacuum. In figures 1,2,3, and 4 the individual types are shown. The construction of

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a melting furnace for 5-50 kg is given. The pressure within the high-vacuum furnace is measured by membrane vacuum gauges. and for a low vacuum BT-2, and for a higher vacuum VMB-1 are used. The amperage varies between 1000 and 3000 A as dependent on the composition of the charge. There are 5 figures.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

SUBMITTED: April 21, 1958

18(3)

AUTHORS: ~~Belyanchikov, L.N.,~~ Grigorash, R.N., Panov, A.V. SOV/163-58-4-7/47

TITLE: Choice of Polarity at Electric Arc Melting of Steel in Vacuum (Vybor polyarnosti pri dugovoy vakuumnoy plavke stali)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958, Nr 4, pp 40 - 45 (USSR)

ABSTRACT: Steel of the following grades was recast: ShKh15, 1Kh 18N9T, steel 45. The steel was melted in an electric arc vacuum furnace in crucibles of 2, 3, 5, 7, and 20 kgs (steel). When melting with one electrode used as cathode (the crucibles being of positive polarity) the metal bath serves as anode. The temperature of the anode spot lies, as a rule, at some hundred degrees above that of the cathode spot, i.e. the metal bath being the anode the thin metal top layer is heavily superheated in the region of the anode spot. The latter causes an increased evaporation of the metal. The metal vapors condense on the walls of the crucibles and form a thin metal coating out of the remelted metal. For this reason, the splashes from the liquid metal bath do not directly arrive at the copper walls of the crucibles, but at the metal coating and form

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a so-called "corona" of the ingot. In this way, the molten metal does not come into immediate contact with the crucible walls but does so with the "corona". The fusion between "coating" and "body" of the ingot is influenced by three factors: current intensity, the ratio of the electrode diameter to the diameter of the crucibles, and the diameter of the crucibles.- When remelting with the electrode used as anode (the electrode being of positive polarity) the situation is different. The copper walls of the crucibles remain unprotected, the metal splashes reach the unprotected cold copper and are tightly welded on. The consequences, when the ingot cools down, are internal strains and cracks.-Therefore, it is more suitable to use the electrode as cathode. There are 5 figures and 3 Soviet references.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

SUBMITTED: May 28, 1958

18(3)

AUTHORS: Belyanchikov, L. N., Grigorash, R. N., Panov, A. V.

SOV/163-59-2-9/48

TITLE: The Behavior of Gases in the Vacuum Arc Melting of Steel (Povedeniye gazov pri vakuumnoy dugovoy plavke stali)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1959, Nr 2, pp 48 - 55 (USSR)

ABSTRACT: This investigation concerns the influence of the melting rate g, of the ratio $\frac{d}{D}$ of the diameters of electrode and crucible, of the application of the magnetic field, and of the polarity on the degasification of the metal. The tests were carried out in a laboratory furnace on crucibles with diameters of 65-85mm. The analysis of the pumped-off gas was made by means of the mass spectrometer MS-2. Figure 1 shows the dependence of the gas liberation V (in cm^3/g) on the melting rate g (g/sec). The V-shaped curves can be represented by the equation $V = \frac{A}{g} + Bg^2$. The values of the coefficients A and B are indicated in table 1 for crucibles of various sizes and for

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various diameter ratios $\frac{d}{D}$. The first term of the equation determines the gas fraction liberated on the anode. The coefficient A approximately increases with the square of the diameter d of the electrode. Figure 2 compares the gas liberation on the electrode with that from the crucible. This comparison shows that hydrogen is mainly liberated on the electrode, while nitrogen, oxygen, and carbon oxide come from the crucible. Figure 3 shows that there are differences between the analytical data and the real gas liberation. They are explained by a gas adsorption on the nonmetallic inclusions and by the metal condensed on the crucible wall. Figure 4 and table 3 show the influence of the diameter ratio $\frac{d}{D}$ on degasification. Under the experimental conditions, the optimum ratio was 0.77. The investigation of the gas content in the metal in different places before and after melting (Tables 3,4,5) showed considerable differences in the upper and lower sections, in the

center and on the periphery after melting. They are explained by the temperature differences and by adsorption on the condensed metal. The application of a magnetic field speeds up the removal of nitrogen, but produces a formation of pores in steel rich in carbon. Tables 7 and 8 show the degasification at pole changing (electrode as cathode and electrode as anode). They only confirm the rising degasification with a rise in current intensity and melting rate. There are 4 figures, 8 tables, and 3 references, 2 of which are Soviet.

ASSOCIATION: Moskovskiy institut stali
(Moscow Steel Institute)

Submitted: August 15, 1958

S/148/60/000/002/001/008

18.7110

AUTHORS: Belyanchikov, L.N., Grigorash, R.N., Panov, A.V.

TITLE: On the Problem of the Metal Temperature in Arc Vacuum Melting Process

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, 1960, Nr 2, pp 32 - 38

TEXT: The authors doubt the existing hypothesis on high and superhigh temperatures of the liquid metal in vacuum arc melting. Investigations of the anode and cathode spots and the arc column show that the temperature of the anode spots does not depend on the current intensity and is determined by the anode material and the pressure of the gas in which the arc is burning. It drops with reduced pressure. The temperature of the cathode spots is always below the temperature of the anode spots and depends also on the pressure. Experiments carried out for the purpose of determining the dependence of the depth of shrinkage cavities on pressure proved that the depth of shrinkage cavities increased with higher pressure. This proved the elevated temperature of the pool. Thus the arc column is the only area of the arc having superhigh

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On the Problem of the Metal Temperature in Arc Vacuum Melting Process

temperatures. Processes occurring in mercury rectifiers of the ignitron or excitron type are compared with analogous phenomena in the vacuum furnace arc. It is shown that the high temperature of the arc column can not be a basic factor in metal degassing, elimination of non-metallic impurities and of the temperature of the liquid metal pool. Results of chemical analyses prove indirectly that the metal is not superheated in arc vacuum melting process. Investigations were carried out into the effect of melting temperature on loss in burning of components in Fe-Al[1] (up to 33% Al), Ni-Cr[1] (up to 47% Cr) and Ni-Mn[1] (up to 43% Mn) alloys. The experiments proved the dependence of loss in burning on the content of volatile components in the alloy. Superheating of the metal pool over the melting temperature was not observed. The authors come to the conclusion that in arc vacuum melting relatively low superheating of metal takes place and that the temperature of the liquid metal is mainly determined by the melting temperature.

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90639

S/148/60/000/002/001/008

On the Problem of the Metal Temperature in Arc Vacuum Melting Process

There are 1 table, 1 set of graphs, 1 oscillogram and 11 references, 8 of which are Soviet and 3 English.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

SUBMITTED: May 11, 1959

4

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80620

S/148/60/000/002/002/008

18.3200

AUTHORS: Belyanchikov, L.N., Grigorash, R.N., Panov, A.V.

TITLE: Electric Conditions and the Selection of Feed Sources for Vacuum Arc Furnaces

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, 1960, Nr 2, pp 39 - 46

TEXT: At present in steel, titanium and zirconium melting in vacuum arc furnaces d.c. is as a rule used, employing welding transformers, high-power d.c. generators and selenium rectifiers. In steel smelting, a formula was found describing the dependence of the arc voltage on the current intensity: $U_{arc} = U_o + R_{arc\ column} \cdot I$ (1) (ABSTRACTOR'S NOTE: Subscripts "arc" and "arc column" are translations of the original $_d$ (duga) and $_{st.d.}$ (stolb dugi)), where U_{arc} is the full drop of the arc voltage, U_o is the sum of the cathode and anode drop of voltage: $R_{arc\ col.}$ is the resistance of the arc column, which depends on the crucible diameter (D) and the electrode diameter (d), and I is the current intensity. Graphs (1-4) show volt-ampere characteristics of a d.c. arc obtained experimentally in a vacuum of 10^{-3} -

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S/148/60/000/002/002/008

Electric Conditions and the Selection of Feed Sources for Vacuum Arc Furnaces

10^{-2} mm Hg for crucibles of 85 - 204 mm in diameter, electrodes of up to 145 mm in diameter and current intensity of up to 6,000 amp. Values of current intensity are cited for various cases of melting used in foreign and Soviet practice. The authors determined the dependence between the lowest limit of current intensity producing satisfactory ingots and the crucible diameter; a formula was developed to evaluate various feed sources used in arc vacuum melting practice (7). The following feed sources are enumerated and characterized: The PSM-1000 type self-excitation welding transformer (60 v, 1000 amp) used for laboratory vacuum furnaces. Its main advantage is the possibility of parallel switching-in the total load. The authors used VSA-5 type selenium rectifiers (64 v, 12 amp) as current feed sources for the independent self-excitation of 3 PSM-1000 transformers. The rectifiers are fed from a RNO-250-5T voltage controller. Industrial furnaces in the USSR are mainly fed from GPN-550-750 type generators (85 v, 6500 amp) with independent excitation and a high-voltage motor. Recently, a special GPN-560-375 type generator (40 v, 14,000 amp) was developed. A graph is presented showing the dependence of maximum current intensity on furnace parameters for various types

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Electric Conditions and the Selection of Feed Sources for Vacuum Arc Furnaces

of generators. As an optimum variant it is recommended to use four parallel-connected PSM-1000 transformers for a current intensity up to 4000 amp. Within a range of 4,000 - 10,000 amp the arc furnace feed may be ensured by parallel-connected PSM-1000 transformers, or 1 to 2 GPN-550-750 generators or 1 GPN-560-375 generator. A voltage of 6000 v is required for the GPN type generators. The GPN-560-375 generator should be preferred to the GPN-550-750 type on account of its lower electric power consumption in melting process. For current intensity of over 10,000 amp the use of parallel-connected GPN-550-750 generators or more powerful machines is recommended. For current intensity of 12,000 - 14,000 amp it is desirable to raise the voltage of GPN-560-375 generators by utilizing excitation sources of higher voltage.
There are: 5 graphs and 8 references, 4 of which are Soviet, 3 English, 1 German.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

SUBMITTED: May 12, 1959

Card 3/3

S/148/61/000/009/005/012
E071/E135

AUTHORS: Belyanchikov, L.N., Grigorash, R.N., and Panov, A.V.

TITLE: Kinetics of the gas evolution during arc smelting in vacuo

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, no.9, 1961, 79-86

TEXT: Knowledge of the rate of gas evolution in the course of smelting is necessary for the correct choice of vacuo equipment of furnaces. Factors influencing the evolution of gas were investigated on a laboratory vacuum arc furnace with exchangeable crucibles of the following capacities: 3 kg (diameter 65 mm; H = 70 mm); 7 kg (diameter 85 mm, H = 170 mm); 20 kg (diameter 102 mm, H = 350 mm); and 50 kg (diameter 150 mm, H = 350 mm). The diameters of electrodes were 28, 52, 70 and 100 mm respectively. Steels and alloys Ст.3 (St.3), ШХ15 (ShKh15), 79НМА (79NMA), Х20Н80 (Kh20N80) and heat resistant alloys based on nickel were used for the investigation. Gases evolved in the course of melting were pumped out by a booster pump and collected in a

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Kinetics of the gas evolution during ...

receiver placed behind the pump which permitted determination of the rate of gas evolution during melting and analysis of the gases evolved, with a mass spectrometer. The analysis of the experimental results leads to the following empirical formula:

$$Q = AU_{\Sigma} + Bg^3 \qquad (4)$$

where: Q - velocity of gas evolution, litres.mm/sec; U_{Σ} - overall throughput capacity of the system, litres/sec; B - coefficient depending on the type of steel, $\frac{\text{litres.mm.sec}^2}{\text{g}}$;

g - velocity of melting, g/sec; A - coefficient depending on the design of the furnace (ratio of the diameter of the electrode to the diameter of the crucible, surface area of gas evolution), mm Hg. The coefficient A:

$$A = \mu \left\{ 1 - \exp \left[- \chi D^4 (1 - \alpha^2)^2 \right] \right\} \qquad (4a)$$

where: D - diameter of crucible, cm; α - ratio of the electrode diameter to the diameter of the crucible; $\mu = 3.7 \times 10^{-3}$ mm Hg; $\chi = 6.0 \times 10^{-5}$ cm^{-4}. The values of the coefficient B for

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various steels and alloys were as follows: Kh20N80 (1-1.6) x 10^{-3}; ShKh15 0.07 x 10^{-4}; 79NMA (0.2-0.8) x 10^{-4}; nickel based heat resistant alloy electrodes (0.10-0.45) x 10^{-4} (cast), 0.18 x 10^{-4} (forged); steel St.3 0.72 x 10^{-4}. It is considered that formula (4) can be used for the calculation of vacuo systems. It was theoretically and experimentally shown that pressures in the crucible and in the working space of the furnace depend on the overall throughput capacity of the system which is limited mainly by the throughput capacity of the clearance between the electrode and crucible. The total throughput capacity of the system U_Σ is determined from:

$$\frac{1}{U_\Sigma} = \frac{1}{U_T} + \frac{1}{U_K} + \frac{1}{U_{Tp}} \qquad (9)$$

where: U_T - throughput capacity of the clearance between the electrode and crucible; U_K - same, between the electrode and the body of the furnace; U_{Tp} - same, of the conduit from the furnace to the pump. The throughput capacities (in litres/sec) of the individual parts of the system can be calculated from the

following equations:

$$U_T = 4.2 \sqrt{\frac{T}{M}} \frac{D_T^3}{H_T} (1 - \alpha^2)(1 - \alpha) \text{ litres/sec;} \quad (10)$$

$$U_K = 4.2 \sqrt{\frac{T}{M}} \frac{D_K^3}{L_K} (1 - \alpha_1^2)(1 - \alpha_1) \left(b + 7.4 \cdot 10^{-2} \frac{D_K - d}{\lambda_1} P_{cp}\right), \quad (11)$$
litres/sec;

$$U_{Tp} = 3.81 \sqrt{\frac{T}{M}} \frac{D_{Tp}^3}{L_{Tp} + 1.33 D_{Tp}} \left(b + 7.4 \cdot 10^{-2} \frac{D_{Tp}}{\lambda_1} P_{cp}\right) \text{ litres/sec;} \quad (12)$$

where: $b \approx 0.9$; D_i - diameter of the given part of the system, cm; d - diameter of the electrode, cm; α_i - ratio of the electrode diameter to the diameter of the crucible or of the furnace; H_T - distance from the outlet of the crucible to the melting zone, cm; L_i - mean length of the given part of the system, cm; λ_1 - mean free path of a molecule at a pressure of 1 mm Hg and temperature of the outgoing gas (T), cm; T - absolute temperature of the outgoing gas; M - mean molecular weight of the outgoing gas; P_{cp} - mean pressure at the given part, mm Hg.

Card 4/6

Kinetics of the gas evolution during ...

In order to evaluate the proportion of pumped out gas in the total balance of degassing, 20kg ingots of steel ShKh15 smelted at various current intensities were analysed along their height for oxygen. The results obtained were compared with the evolution of gas (recalculated on oxygen) in the course of smelting. To exclude from the calculations the influence of the absorption of gases by the crown of the ingot, the calculations were carried out assuming that the velocity of gas evolution is the same during the whole period of melting and equals the velocity of gas evolution in the top part of the crucible. For crucibles 100 mm in diameter, at a current intensity of 1200 A, the flotation of inclusions plays the main role in the refining of the metal; thereby the reduction of oxides with carbon was not observed. On increasing the current to 1400 A the nature of refining remains the same but reduction of the floated inclusions in the surface layer of the bath in the anode region was observed. If the current intensity is increased to 2500-3000 A a reduction of oxides takes place in the whole volume of the bath. The results of smelting at 5000 A could not be interpreted and require further studies.

Card 5/6

Kinetics of the gas evolution during... S/148/61/000/009/005/012
E071/E135

There are 4 figures, 2 tables and 5 references: 4 Soviet-bloc and 1 English. The English language reference reads as follows:

Ref.5: G.W. Suiter. G. Electrochemical Society, 1958, v.105, No.1.

ASSOCIATION: Moskovskiy institut stali
(Moscow Steel Institute)

SUBMITTED: March 30, 1961

Card 6/6

18.1151

39065
S/148/62/000/005/002/009
E071/E135

AUTHORS: Belyanchikov, L.N., Grigorash, R.N., and Panov, A.V.

TITLE: Arc vacuo smelting of chromiumnickel and ironchromiumnickel alloys with the application of vibrations

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, no.5, 1962, 69-77

TEXT: The influence of the electrical smelting conditions and of vibrations on the properties of the Fe-Cr-Ni alloy Н36ХТЮ (N36KhTYu) and a Cr-Ni alloy on the metal quality was investigated in order to establish optimum smelting conditions. The metal for the 65 mm diameter electrodes was melted in a 50 kg open induction furnace with a magnesite crucible and remelted in a laboratory vacuo arc furnace. From the heats 7kg ingots, 85 mm in diameter and 170 mm high, were produced. Heats of the N36KhTYu alloy were produced, with and without 233 c.p.s. vibrations, using current intensities of 1500, 2400 and 3400 A (175, 280 and 400 A/cm of the crucible diameter) and vacuo of 1×10^{-3} - 2×10^{-3} mm Hg. The ingots obtained were cut in half

Card 1/3

Arc vacuo smelting of ...

longitudinally. One half was used for macrosections; the other was forged into a rod 20 mm in diameter from which specimens for tests and analyses were made. All ingots forged satisfactorily; ingots melted at 1500 A forged better than others. Ingots melted with vibrations had the same ductility as ingots melted without vibrations for the heats produced with current intensities of 1500 and 2400 A and a somewhat lower ductility for heats produced with 3400 A. The degree of oxygen degassing (i.e. removal of non-metallic inclusions) increases with increasing current intensity; with vibrations the maximum degree of degassing is obtained at about 300 A/cm of crucible diameter, without vibrations at about 400 A/cm. The macrostructure showed that changes in the electrical conditions and use of vibrations have a strong influence on the crystallization. Vibrations result in a sharp decrease of the zone of columnar crystals and formation of a large zone of equiaxial crystals in the centre. There is nearly linear relationship between the current intensity and the diameter of the latter zone. Luminescence analysis indicated that, in addition to the zone adjacent to the shrinkage cavity, the zone

39065

Arc vacuo smelting of ... S/148/62/000/005/002/009
E071/E135

of columnar crystals is most affected by internal defects. Therefore, with increasing current intensity and power of the vibrator, the zone free from internal defects should increase. Creep tests indicate that with increasing current intensity and superposition of vibrations there is a substantial improvement in the creep resistance. Optimum melting conditions: 300-350 A/cm of crucible diameter using vibrations of a high power. A single phase Cr-Ni alloy was melted under the following conditions: 3000 A (350 A/cm), 167 c.p.s. vibrations using a vibrating rod of 76 mm diameter (kinetic moment 0.35 kgcm). For comparison the same alloy was melted without vibrations; the ingots melted without vibrations could not be forged despite a prolonged annealing, while ingots melted with vibrations forged satisfactorily. The creep strength at 800, 850 and 900 °C improved considerably as a result of vibration during melting.
There are 4 figures and 5 tables.
ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)
SUBMITTED: December 26, 1961

Card 3/3

BELYANCHIKOV, L.N.; GRIGORASH, R.N.; YEVSEYEV, P.P.; PANOV, A.V. [deceased]

Peculiarities of the operating conditions of electric slag refining equipment. Izv. vys. ucheb. zav.; chern. met. 6 no.7:76-82 '63. (MIRA 16:9)

1. Moskovskiy institut stali i splavov.
(Zone melting) (Electrometallurgy)

L 53755-65 EPA(s)-2/EWT(m)/EPF(n)-2/EWP(t)/EWP(b) Pt-7/Pu-4 IJP(c)
JD/MW/JG

ACCESSION NR: AR5009001 S/0137/65/000/002/V045/V045
669.187.2.083.4:621.365.22.213.42.536.5

SOURCE: Ref. zh. Metallurgiya, Abs. 2V329

AUTHOR: Belyanchikov, L. N.

TITLE: Temperature distribution on the surface of the metal bath in vacuum-arc steel smelting

CITED SOURCE: Elektrotermiya. Nauchno-tekhn. sb., vyp. 37, 1964, 14-15

TOPIC TAGS: metallurgy, ferrous metal, arc furnace, vacuum furnace, temperature distribution, steel

TRANSLATION: Electric smelting conditions were studied with regard to their effect on vaporization of Mn and Fe alloys in a vacuum-arc furnace with consumable electrode. These studies showed that the area of the anode spot is 1.5-2.0% of the bath surface in furnaces with an ingot 26-36 cm in diameter. For larger ingots, this percentage is still smaller. It is pointed out that the high temperature

Card 1/2

L 53755-65
ACCESSION NR: AR5009001

region is the main factor in vaporization processes no matter how small the area. The results may be used for theoretical calculations on metal vaporization in vacuum-arc furnaces and for determining the temperature distribution in a molten metal bath. D. Kashayeva.

SUB CODE: IE, MM ENCL: 00

Card 2/2

L 30056-65 EWT(m)/EWA(d)/T/EWP(t)/EWP(b) MJW/JD
ACCESSION NR: AP5002976 S/0133/65/000/001/0071/0072

23
22
B

AUTHOR: Belyanchikov, L. N. (Candidate of technical sciences)

TITLE: Degassing of steel in the solid state

SOURCE: Stal', no. 1, 1965, 71-72

TOPIC TAGS: steel degassing, solid degassing, vacuum annealing / steel 1Kh18N9, steel ShKh15, steel 45KhN2SV2, steel 79NMA, steel Kh20N80, steel EI661

ABSTRACT: Modern technology requires steel with minimum gas liberation in a vacuum at high temperatures. Vacuum melting does not always achieve such results. Therefore, the author investigated degassing of several types of steel in a special vacuum retort made of 1Kh18N9T steel. The retort could stand short heating up to 1300C and long runs at 800C. Machined rods of 55-70 mm diameter were degassed at a pressure of $1 \cdot 10^{-5}$ mm Hg. Upon reaching the desired temperature, the vacuum pump was switched off and the increasing pressure measured. Gas samples were analyzed. The results are tabulated for each steel type showing total degassing in mm^3/sec. at the given temperature. Gas liberation by the retort itself was taken into account. Gases consisted of H_2, N_2, O_2, CO and CO_2. On the average, the O_2

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L 30056-65
ACCESSION NR: AP5002976

content in solid steel decreased by 30%. Part of the carbon (50%) was oxidized to CO and CO_2. Nonmetallic impurities decreased by 21.5%. Oxides (content 10^{-4}%) decreased by 25.8%. Remelting of ordinary and of degassed electrodes in a vacuum arc furnace showed a corresponding difference in gas liberation. Orig. art. has: 1 figure and 3 tables.

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow steel and alloys institute)

SUBMITTED: 00 ENCL: 00 SUB CODE: MM

NO REF SOV: 001 OTHER: 000

Card 2/2

L 62772-65 EWT(l)/EWT(m)/T/EWP(t)/EEC(b)-2/EWP(b) Pi-4 IJP(c) JD/GG
ACCESSION NR: AR5017409 UR/0137/65/000/006/V040/V040

SOURCE: Ref. zh. Metallurgiya, Abs. 6V259

AUTHOR: Belyanchikov, L. N.

TITLE: Stabilization of crystallization processes in vacuum arc furnaces

CITED SOURCE: Elektrotermiya. Nauchno-tekhn. sb., vyp. 42, 1964, 19-21

TOPIC TAGS: crystallization, vacuum arc furnace, ingot, vacuum melting, stabilization

TRANSLATION: To decrease waste of metals, it is necessary to choose such conditions for electric melting as will ensure a maximum degree of stability in the crystallization and refining of the metal throughout the thickness of the ingot. The article gives equations which permit achieving optimum electrical conditions. Use of the recommended conditions permits raising the yield of usable ingots in vacuum melting from 70-75% to 85-90%. 3 figures. D. Kashayeva.

Card 1/1 SUB CODE: MM ENCL: 00

L 62598-65 EWP(e)/EWA(c)/EWT(m)/EWP(t)/ETI/EWA(d)/EWP(z) IJP(c) JD

ACCESSION NR: AP5018176 UR/0148/65/000/007/0074/0077 24
669.187.083.4:621.746.75 23
B

AUTHOR: Belyanchikov, L. N.

TITLE: Principles of the removal of nonmetallic inclusions during vacuum arc melting

SOURCE: IVUZ. Chernaya metallurgiya, no. 7, 1965, 74-77

TOPIC TAGS: vacuum arc melting, steel refining, alumina, silica, iron oxide, ShKh15 steel

ABSTRACT: The object of this work was to determine the effect of the electric melting conditions on the removal of nonmetallic impurities. The behavior of the latter was investigated during the remelting of ShKh15 steel containing 0.013% nonmetallic inclusions of the following composition: 55.7% Al_2O_3; 34.3% SiO_2, and 3.73% FeO. The different nonmetallic inclusions were removed from the metal in different ways (aluminum-containing spinels were removed much better than iron silicates). Such differences in behavior are discussed in terms of the surface tension, angle of wetting, and particle shape. Particles containing Al_2O_3 are not wetted by the metal as well as silicate inclusions are, and should therefore rise to the surface in much greater quantities and be removed more extensively. This mechanism of removal of inclusions is correlated with the effect of the

Card 1/2

L 62598-65

ACCESSION NR: AP5018176

current intensity on the removal of silicates and aluminum-containing particles in vacuum arc melting. For ShKh15 steel, the curve representing the degree of removal of nonmetallic impurities versus the current intensity shows a broad maximum between 1500 and 2500 A. An analysis of the oxygen content of the metal as a function of the electrical parameters gave results similar to the above. It is concluded that in vacuum arc melting, the main factor determining the purity of the metal in terms of nonmetallic inclusions is the temperature regime of the bath, which in turn is a function of the electrical parameters. Orig. art. has: 3 figures and 1 formula.

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow Institute of Steel and Alloys)

SUBMITTED: 07Oct64 ENCL: 00 SUB CODE: MM

NO REF SOV: 008 OTHER: 001

Card 2/2

L 42036-66 EWT(m)/T/EWP(t)/ETI LIP(c) JD

ACC NR: AR6005796 SOURCE CODE: UR/0137/65/000/010/B015/B015

AUTHOR: Belyanchikov, L. N.

39
B

TITLE: Glow-discharge degassing of the inner cavity of high-vacuum furnaces

SOURCE: Ref. zh. Metallurgiya, Abs. 10B90

REF SOURCE: Elektrotermiya. Nauchno-tekhn. sb., vyp. 43, 1965, 14-17

TOPIC TAGS: glow discharge, vacuum degassing, desorption, carbon steel

ABSTRACT: The employment of high-voltage glow discharge (P) makes it possible to markedly enhance the rate of vacuum desorption from the surface of metal products, and the optimal pressure this requires is of the order of $1 \cdot 10^{-2}$-$5 \cdot 10^{-2}$ mm Hg. The rate and completeness of the degassing are maximal when the polarity "treated product-anode, auxiliary electrode--cathode" is utilized. Degassing rate increases with increasing power of P. Under optimal conditions the increase in degassing rate on employing P amounts for carbon steel to $4 \cdot 10^{-9}$ ncm^3/cm^2-w-sec. V. Pryanikova. [Translation of abstract]

18

SUB CODE: 20, 13, 11

Card 1/1 af UDC: 669.1:66.041.62

L 40037-66 EWP(k)/EWT(m)/EWP(t)/ETI IJP(c) JH/JD

ACC NR: AP6017301 (N) SOURCE CODE: UR/0136/66/000/005/0094/0095

48

B

AUTHOR: Belyanchikov, L. N.

ORG: none

TITLE: Smelting of aluminum alloys in a vacuum arc furnace equipped with a consumable electrode (Abstract of a scientific research paper)

SOURCE: Tsvetnyye metally, no. 5, 1966, 94-95

TOPIC TAGS: aluminum alloy, vacuum arc furnace, electric arc, vacuum arc, metal extracting

ABSTRACT: The electrical conditions, crystallization processes, and the change in the chemical composition of the metal during smelting of aluminum alloys in a vacuum arc furnace with consumable electrode were studied. The experimental results are presented graphically (see Fig. 1). The dependence of the rate of electrode melting and the depth of the liquid bath H on the current I is given by

$$y = 0,7 \cdot 10^{-2} (I - 200),$$

and

$$H = 0,35 \cdot 10^{-2} (I - 300).$$

It is also shown that the profile shape of the liquid bath during vacuum arc

Card 1/3 UDC: 669.715:621.365.2

L 40037-66

ACC NR: AP6017301

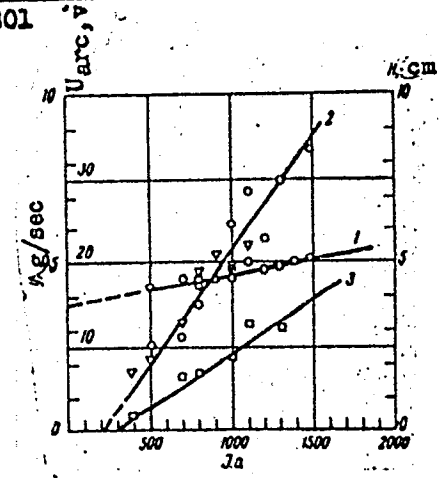

Fig. 1. The effect of current strength on: 1 - voltage; 2 - rate of electrode melting (o - alloy, 95% Al + 5% Mo; ▽ - alloy, 98% Al + 2% Zn); 3 - depth of liquid bath (alloy Al - Zn).

smelting is given by

$$\frac{y}{H}=\frac{\frac{3}{2}\left(1+\frac{\lambda}{\alpha R}\right)}{\frac{3}{2}\frac{\lambda}{\alpha R}+\frac{1}{2}}\left(\frac{x}{R}\right)^2-\frac{1}{\frac{3}{2}\frac{\lambda}{\alpha R}+\frac{1}{2}}\left(\frac{x}{R}\right)^4,$$

where R is the ingot radius, λ is the coefficient of heat conduction of the

Card 2/3

L 40037-66

ACC NR: AP6017301 O

metal, and α is the coefficient of heat transfer from the ingot side surfaces. It was found that the best conditions for smelting were obtained for H ≅ R and I = 1200 amp. Orig. art. has: 1 graph and 4 equations.

SUB CODE: 11/13/ SUBM DATE: none/ ORIG REF: 002

Card 3/3

BELYANCHIKOV, L.N.; GRIGORASH, R.N.; PANOV, A.V.

Electric arc-vacuum smelting of chromium-nickel and iron-chromium-nickel alloys with use of vibration. Izv. vys. ucheb. zav.; chern. met. 5 no.5:69-77 '62. (MIRA 15:6)

1. Moskovskiy institut stali.
(Iron-chromium-nickel alloys--Electrometallurgy)
(Chromium-nickel alloys--Electrometallurgy)

BELYANCHIKOV, M.P., inzhener.

Development of high-speed spindle design based on rolling antifriction bearings. Podshipnik no.7:1-5 Jl '53. (MLRA 6:8)
(Roller bearings)

BELYANCHIKOV, M.P.

SPITSYN, N.A., doktor tekhnicheskikh nauk, professor; BELYANCHIKOV, M.P., inzhener.

Operation of electric internal grinding spindles. Vest. mash. 33 no.12:26-28 D '53. (MLRA 6:12)
(Grinding and polishing)

S/124/60/000/006/036/039
A005/A001

Translation from: Referativnyy zhurnal, Mekhanika, 1960, No. 6, p. 181, # 8129

AUTHORS: Belyanchikov, M.P., Narodetskiy, M.Z., Spitsyn, N.A.

TITLE: The Development of the Theory of Calculation of Antifriction Bearings During 15 Years

PERIODICAL: Tekhnol. podshipnikostroyeniya, 1958, No. 17, pp. 181-193

TEXT: The authors present a brief review on the theoretical investigations applied to antifriction bearings. These investigations may be divided into a number of divisions: 1) Contact problems of the elasticity theory. Works on investigation of the contact stresses pertain hereto, which arise between the ball or the roller and the race of the bearing. 2) The application of the classical methods of the two-dimensional elasticity theory to the solution of several problems of antifriction bearing designing. The problem of stresses is solved, which occur in the bearing races. On the basis of this work, minimum allowances were determined which are necessary for mounting the bearing into the engine case. 3) The development of new methods for solving the problems of the two-dimensional elasticity theory for calculating the components of antifriction bearings. The

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S/124/60/000/006/036/039
A005/A001

The Development of the Theory of Calculation of Antifriction Bearings During 15 Years

stresses in plates with circular apertures are considered by new methods. 4)The investigation of the load distribution between the rolling bodies of the bearing. Results are presented of works on determining the distribution of the axial and radial loads between the balls of radial thrust bearings. 5) The investigation of the influence of the radial gap on the carrying power and the service life of antifriction bearings. It turned out that the carrying power of the bearings rapidly decreases with an increasing gap between the balls and rollers and the races of the bearing. The optimum conditions of the bearing operation are obtained for zero-gap. 6) Investigations of kinematics and dynamics of special shapes of bearings. The kinematics and dynamics of the motion of the balls in thrust bearings are considered. 7) Theoretical investigation of high-speed bearings and loads, to which the bearing elements are subjected at high speeds. The loads affecting the bearing retainer and the heat emission in the bearing are determined.

A.I. Golubev

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2

MELYANCHIKOV, M.P.; PLESKOV, Yu.V.; POMINOV, V.G.

Instrument with a rotating disc electrode. Zhur.fiz.khim. 34 no.7:1638-1642 Jl '60. (MIRA 13:7)

1. Akademiya nauk SSSR, Institut elektrokhimii.
(Electrodes) (Chemical apparatus)

BAYKOV, S.P., kand. tekhn. nauk; BELENKO, I.S., kand. tekhn. nauk; BELKOV, S.F., inzh.; BELYANCHIKOV, M.P., inzh.; BERNSHTEYN, I.L., inzh.; BOGORODITSKIY, D.D., inzh.; BOLONOVA, Ye.V., kand. tekhn. nauk; BROZGOL', I.M., kand. tekhn.nauk; VLADIMIROV, V.B., inzh.; VOLKOV, P.D., kand. tekhn. nauk; GERASIMOVA, N.N., inzh.; ZHUKHOVITSKIY, A.F., inzh.; KARANOV, M.F., inzh.; KANEVTSOV, V.M., kand. tekhn. nauk; KOLOTENKOV, I.V., inzh.; KONDRAT'YEV, I.M., inzh.; KUZNETSOV, I.P., kand. tekhn. nauk; L'VOV, D.S., kand. tekhn. nauk; LYSENKO, I.Ya., kand. tekhn. nauk; MAKAROV, L.M., inzh.; GLEYNIK, N.D., inzh.; RABINER, Ye.G., inzh.; ROZHDESTVENSKIY, Yu.L., kand. tekhn. nauk; SAKHON'KO, I.M., kand. tekhn. nauk; SIDOROV, P.N., inzh.; SPITSYN, N.A., prof., doktor tekhn. nauk; SPRISHEVSKIY, A.I., kand. tekhn. nauk; CHIRIKOV, V.T., kand. tekhn.nauk; SHEYN, A.S., kand. tekhn. nauk; NIBERG, N.Ya., nauchnyy red.; BLAGOSKLONOVA, N.Yu., inzh., red. izd-va; SOKOLOVA, T.F., tekhn. red.

[Antifriction bearings; manual] Podshipniki kacheniia; spravochnoe posobie. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1961. 828 p. (MIRA 15:2)
(Bearings (Machinery))

BELYANCHIKOV, N.I., kand.tekhn.nauk, dotsent

Milking machine with vacuum protection for the teat. Izv. TSKhA no.4:239-240 '61. (MIRA 14:9)

(Milking machines)

BELYANCHIKOV, N. N.

Dissertation: "Research Into the Process of Oil Production and Its Mechanization on Collective and State Farms." Cand Tech Sci, Moscow Inst of the Mechanization and Electrification of Agriculture, Moscow 1953.

W-30928

SO: Referativnyy Zhurnal, No. 5, Dec 1953, Moscow, AN USSR (N-[illegible])

BELYANCHIKOV, N.N., kand.tekhn.nauk

A fast-pulse milking machine. Zhivotnovodstvo 20 no.11:75-76 N '58. (MIRA 11:11)

(Milking machines)

TROFIMOV, Vladimir Ivanovich, kand. tekhn. nauk; BELYANCHIKOV, Nikolay Nikolayevich, kand. tekhn. nauk; FEDOTOV, V.G., red.

[Mechanization of labor consuming processes on livestock farms] Mekhanizatsiia trudoemkikh protsessov na zhivotnovodcheskikh fermakh. Moskva, Rossel'khozizdat, 1964. 304 p. (MIRA 18:12)

BELYANCHIKOV, P.P., inzh.

UKM level indicator. Stroi.i dor.mash. 6 no.8:24 Ag '61. (MIRA 14:8)

(Level indicators)

BELYANCHIKOV, P.P., inzh.

Mechanization of the extraction of natural wall stone. Stroi. i dor. mash. 7 no.5:25-28 My '62. (MIRA 15:5)
(Stonecutting)
(Quarries and quarrying)
(Automatic control)

GAL'PERIN, M.I., doktor tekhn. nauk, prof.; ABEZGAUZ, V.D., kand. tekhn. nauk; BELYANCHIKOV, P.P., inzh., retsenzent; OTDEL'NOV, P.V., red.izd-va; EL'KIND, V.D., tekhn. red.

[Stonecutting machines] Mashiny dlia rezaniia kamnia. Izd.2., perer. i dop. Moskva, Mashgiz, 1964. 338 p. (MIRA 17:3)

BELYANCHIKOV, P.P., inzh.; PRONIN, G.N., inzh.; SUNDATOV, V.I., inzh.

Modernized ADUB automatic weighing batchmeter for cyclic operation. Stroi.i dor.mash. 7 no.2:30-32 F '62. (MIRA 15:5)
(Proportioning equipment) (Concrete)

BELYANCHIKOV, V.N., redaktor, inzhener.

[Catalog of wearing parts for the E-257 excavator] Katalog iznashivaiushchikhsia detalei ekskavatora E-257. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. i sudostroit. lit-ry, 1953. 62 p.

1. Russia (1923 - U.S.S.R.) Ministerstvo transportnogo i tyazhelogo mashinostroyeniya. Upravleniye zakazov i sbyta. (Excavating machinery)

BELYANCHIKOV, V.N., inzhener, redaktor.

[Catalog of wearing parts for the E-1003 and E-1004 power shovels] Katalog iznashivaiushchikhsia detalei ekskavatorov E-1003 i E-1004. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. i sudostroit. lit-ry, 1953. 75 p. (MLRA 7:4)

1. Russia (1923- U.S.S.R.) Ministerstvo transportnogo i tyazhelogo mashinostroeniya. Upravlenie zakazov i sbyta.
(Excavating machinery)

BELYANCHIKOV, V.N., inzhener, redaktor.

[Catalog of wearing parts of the E-505 power shovel] Katalog iznashivaiushchikhsia detalei ekskavatora E-505. Moskva, Gos.nauchno-tekhn. izd-vo mashinostroit. i sudostroit. lit-ry, 1953. 119 p. (MLRA 7:6)

1. Russia (1923- U.S.S.R.) Ministerstvo transportnogo i tyazhelogo mashinostroyeniya. Upravleniye zakazov i sbyta. (Excavating machinery)

BELYANCHIKOV, V.N., inzhener, redaktor; MODEL', B.I., tekhnicheskiy redaktor

[Catalog of wearing parts of road machinery] Katalog iznashivaiushchikhsia detalei dorozhnykh mashin. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroitel'noi lit-ry, 1954. 382 p. (MLRA 8:6)

1. Russia (1923- U.S.S.R.) Ministerstvo stroitel'nogo i dorozhnogo mashinostroeniia.
(Road machinery)